

What is claimed is:

1. An optical component for selectively reconfiguring a guided wave optical signal,
comprising:

5 an optical waveguide having an input port for receiving light and an output port for
outputting reconfigured light;

 a first lightwave circuit element optically coupled to said optical waveguide by means
of a first electrically variable grating;

 a first electrode arrangement overlaying said first electrically variable grating;

10 a second lightwave circuit element optically coupled to said first lightwave circuit
element by means of a second electrically variable grating;

 a second electrode arrangement overlaying said second electrically variable grating;

 wherein each of said first and second electrode arrangements have a first portion
adapted to form a first electric field in response to first applied voltage and a second
15 portion adapted to form a second electric field in response to a second applied voltage,
said first and second electrode portions are spaced from one another in the direction of
light propagation, and wherein said first and second electric fields are generally
orthogonal to one another and transverse to the direction of light propagation.

- 20 2. The optical component of claim 1, wherein:

 said optical signal is a multi-channel WDM signal;

at least one selected channel is transferred between said optical waveguide and said first lightwave circuit element when said first voltage and said second voltage are applied to said first electrode arrangement; and

said at least one selected channel is transferred between said first lightwave circuit element and said second lightwave circuit element when said first voltage and said second voltage are applied to said second electrode arrangement.

3. A component as claimed in claim 1, wherein said variable grating is an ESBG.
4. A component as claimed in claim 1, wherein said first lightwave circuit element is a ring coupler waveguide.
5. A component as claimed in claim 1, wherein said first lightwave circuit element is an S-shaped coupling waveguide.
6. A component as claimed in claim 1, wherein the order of said first and second electrode portions of said second electrode arrangement is reversed with respect to said first and second portions of said first electrode arrangement.
7. A component as claimed in claim 1, wherein said first and second variable gratings each comprise a multiplicity of individually switchable grating sections, each said grating section having a unique spatial frequency corresponding to a unique grating resonance

wavelength, and wherein each grating section is overlayed by an independent electrode arrangement.

8. A component as claimed in claim 1, wherein said component functions as an optical add
5 drop multiplexer

9. The optical component of claim 1, further comprising:

a third lightwave circuit element optically coupled to said first lightwave circuit
element by means of a third electrically variable grating;

- 10 a third electrode arrangement overlaying said third electrically variable grating;

wherein said third electrode arrangement has a first portion adapted to form a first
electric field in response to first applied voltage and a second portion adapted to form a
second electric field in response to a second applied voltage, said first and second
electrode portions spaced from one another in the direction of light propagation, and
15 wherein said first and second electric fields are generally orthogonal to one another and
transverse to the direction of light propagation.

10. The optical component of claim 9, wherein:

said optical signal is a multi-channel WDM signal;

- 20 at least one selected channel is transferred from said optical waveguide to said second
lightwave circuit element when said first voltage and said second voltage are applied to
said first and second electrode arrangements; and

said at least one selected channel is transferred between said third lightwave circuit element and said optical waveguide when said first voltage and said second voltage are applied to said first and third electrode arrangements.

- 5 11. A component as claimed in claim 9, wherein said first lightwave circuit element is a ring coupler waveguide.
12. A component as claimed in claim 9, wherein the order of said first and second electrode portions of said second and third electrode arrangement is reversed with respect to said
- 10 first and second portions of said first electrode arrangement.
13. A component as claimed in claim 9, wherein said first, second, and third variable gratings each comprise a multiplicity of individually switchable grating sections, each said grating section having a unique spatial frequency corresponding to a unique grating resonance
- 15 wavelength, and wherein each grating section is overlaid by an independent electrode arrangement.
14. A component as claimed in claim 9, wherein said component functions as an optical add drop multiplexer